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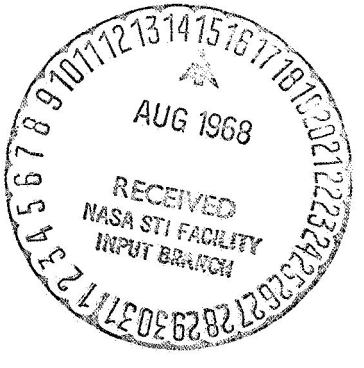

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EXPERIMENTS ON THE FERTILIZATION OF OVERMATURE EGGS

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ABSTRACT: Presents the results of several series of experiments on fertilization of overmature eggs in frogs.

The well-known experiments of Thury have given rise to the question /76* whether the degree of maturity of the egg exerts an influence on the sex ratio. With the aid of the technique described by me in the preceding paper, it is possible to obtain eggs of the common brown frog of the degree of maturity desired. Animals in heat are separated and following separation kept separated in damp moss in a dark, cool place, for which purpose I selected the deep cellar of the Institute of Physiology. Only a small number of females deposited eggs under these conditions, and most of them kept their eggs until these died in the uterus, which fact caused the death of the animal itself. The longest period of time during which I was able to obtain overmature eggs extended from April 20th to May 7th, i.e., it covered approximately 14 days.

It is, of course, obvious that the condition of the sperm cannot be regarded as being insignificant in investigations concerning the maturity of eggs.

Thus three different combinations at least are possible:

1. Both the egg and the sperm are at the peak of development;

2. The egg is at the peak of its development, and the sperm is overmature;

3. The sperm is at the peak of its development, and the egg is overmature.

One can make experimental arrangements, as I have done, for one batch of eggs of one female to be fertilized at the stage of peak development and for another batch of eggs of the same female to be fertilized at the stage of overmaturity. Since, however, the former stage is the one occurring first in time, it is impossible to carry out the first fertilization with overmature sperm and then to carry out the second one with freshly matured sperm of the same male. Differences based on individual characteristics may, thus, lead to the finding of /77 erroneous results, which must then be eliminated with the aid of extensive and difficult experiments, such as are described in the first and second paper of this journal issue. To do just that has also been my intention. Unfortunately, however, my undertakings have miscarried because some of my female spawned prematurely, some other died, and furthermore because the eggs removed from the uteri at the end of April and in particular those removed in May proofed to be not viable, or because the eggs developing to some extent died subsequently.

*Numbers in the margin indicate pagination in the foreign text.

Thus, there remained only a small number of experiments for evaluation, and this number was not sufficient to exclude with any degree of certainty individual influences different males may have exerted on the sex ratios of the froglets.

In one series of experiments carried out by me, I mainly obtained females; in others, I chiefly obtained males. The results obtained without exception answered my expectations. Upon second thought, I must, however, say that the number of experiments simply was too small, and they must be repeated.

I should, however, like to report one peculiar finding.

In small cultures, I obtained a surprisingly great number of froglets, the gonads of which exhibited even in August a completely embryonal character, which gonads were indeed atrophic or could not be demonstrated at all.

In one instance, I found among 69 young froglets derived from overmature eggs, not less than 12 animals exhibiting atrophic gonads, which only upon close examination through a magnifying glass were shown to be the filament-like structure close to the kidneys, which structures actually looked like peritoneal folds.

In another instance, I found among 102 young froglets derived from overmature eggs a total of 19 animals exhibiting stunted gonads. These animals, I must admit, were not very strong ones; but I made similar findings in large as well as in well-fed small froglets grown in the same manner so that this phenomenon can certainly not be ascribed to poor feeding.

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